

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A catheter for use in conveyance of a formulation, the catheter comprising:
~~first and second materials~~ a first layer; and
a barrier layer circumferentially adjacent to the first layer;
wherein the first layer and the barrier layer are configured to define a tubular structure,
the tubular structure having a proximal and a distal end; and
~~wherein the second material has a permeability lower than polyethylene for CO₂ to prevent obstructions from forming in the formulation.~~ barrier layer is configured to provide a barrier to the diffusion of CO₂.
2. (Currently amended) The catheter as recited in claim 1, wherein the ~~first material layer~~ barrier layer is disposed outside the ~~second material.~~
3. (Currently amended) The catheter as recited in claim 1, wherein the ~~first material layer~~ barrier layer is disposed inside the ~~second material.~~
4. (Currently amended) The catheter as recited in claim 1, wherein the first layer comprises a first material and the barrier layer comprises a second material and wherein the second material comprises a material that has a permeability index for CO₂ that is lower than the permeability index of the outer material for CO₂ of the first material.

5. – 7. (Cancelled)

8. (Currently amended) The catheter as recited in claim 1, wherein the ~~second material~~ barrier layer comprises a material selected from the group consisting of halogenated polymers.

9. (Original) The catheter as recited in claim 8, wherein the halogenated polymer is selected from the group essentially consisting of polytetrafluorethylene, polyvinylidene chloride and polyvinylidene fluoride.

10. (Currently amended) The catheter as recited in claim 1, wherein the ~~second material~~ barrier layer comprises a material selected from the group consisting essentially of polyamides, ethylene-vinyl alcohol, polyetheretherketone, nylon and polyester.

11. (Currently amended) The catheter as recited in claim 1, wherein the ~~second material is~~ barrier layer comprises capillary glass.

12. (Currently amended) The catheter as recited in claim 1, wherein the ~~second material~~ barrier layer is diamond coated.

13. (Currently amended) The catheter as recited in claim 1, wherein the ~~first material layer~~ layer comprises a material that is bio-compatible.

14. (Currently amended) The catheter as recited in claim 2, wherein an inner surface of the first ~~material~~ layer substantially covers an outer surface of the ~~second material.~~ barrier layer.

15. (Currently amended) The catheter as recited in claim 2, wherein an inner surface of the first ~~material~~ layer covers only a portion of an outer surface of the ~~second material~~. barrier layer.

16. (Currently amended) The catheter as recited in claim 15, wherein the portion of the outer surface of the ~~second material~~ barrier layer covered by the inner surface of the first ~~material~~ layer is located at the distal end.

17. (Currently amended) The catheter as recited in claim 1, further comprising an interior layer contacting an inner surface of the ~~second material~~, barrier layer, the interior layer comprising a substance that regulates an interaction of substances with the interior layer.

18. (Original) The catheter as recited in claim 17, wherein the substance is a hydrophilic substance.

19. (Original) The catheter as recited in claim 17, wherein the substance is a hydrophobic substance.

20. (Currently amended) The catheter as recited in claim 1, wherein an inner diameter of the distal end has a flared ~~shape~~. shape having a wider end, the wider end located at the distal end.

21. (Original) The catheter as recited in claim 20, wherein an outer diameter of the distal end is substantially constant across the flared shape.

22. (Original) The catheter as recited in claim 1, wherein the proximal end is connected to an implantable infusion pump.

23. (Currently amended) The catheter as recited in claim 1, wherein the first layer comprises a first material and the barrier layer comprises a second material and wherein the first material is more flexible than the second material.

24. (Currently amended) The catheter as recited in claim 1, wherein the first layer comprises a first material and the barrier layer comprises a second material and wherein the first material has a lower flexural modulus than the second material.

25. – 43. (Cancelled)

44. (Currently amended) An implantable infusion pump system for use in delivery of a formulation, the system comprising: The catheter as recited in claim 22,

a pump for delivering wherein the infusion pump delivers measured doses of a formulation; the formulation; and

wherein the infusion pump has a sensing device device, the sensing device for regulating the delivery of the formulation; and formulation.

a catheter for conveying the formulation from the pump to an infusion site, the catheter comprising:

an outer material;

an inner barrier material;

a proximal end attached to the pump; and

a distal end located at the infusion site;

wherein the barrier material has a permeability lower than polyethylene for CO₂ to prevent obstructions from forming in the formulation.

45. – 46. (Cancelled)

47. (Currently amended) ~~A n~~ An implantable infusion pump system for use in delivery of a formulation, the system comprising:

a pump for delivering measured doses of a formulation;

a sensing device for regulating the delivery of the formulation; and

a catheter for conveying the formulation from the pump to an infusion site, the catheter comprising:

a first layer; and

a barrier layer circumferentially adjacent to the first layer;

wherein the first layer and the barrier layer are configured to define a tubular structure, the tubular structure having a proximal and a distal end;

wherein a proximal the proximal end is attached to the pump; and

wherein a distal the distal end is located at the infusion site; and

wherein the catheter comprises a material having a permeability lower than polyethylene for CO₂ to prevent obstructions from forming in the formulation. barrier layer is configured to provide a barrier to the diffusion of CO₂.

48. (Currently amended) The implantable infusion pump system as recited in claim 47, wherein the ~~material~~ barrier layer comprises a material selected from the group consisting of halogenated polymers.

49. (Original) The implantable infusion pump system as recited in claim 48, wherein the halogenated polymer is selected from the group essentially consisting of polytetrafluorethylene, polyvinylidene chloride and polyvinylidene fluoride.

50. (Currently amended) The implantable infusion pump system as recited in claim 47, wherein the ~~material~~ barrier layer comprises a material selected from the group consisting essentially of polyamides, ethylene-vinyl alcohol, polyetheretherketone, nylon and polyester.

51. (Currently amended) The implantable infusion pump system as recited in claim 47, wherein the ~~material is~~ barrier layer comprises capillary glass.

52. (Currently amended) The implantable infusion pump system as recited in claim 47, wherein the ~~material~~ barrier layer is a ~~diamond-coated material~~. diamond coated.

53. - 54. (Cancelled)

55. (Currently amended) A catheter for use in conveyance of a formulation, the catheter comprising:

~~first and second materials~~ a first layer; and
a barrier layer circumferentially adjacent to the first layer,
wherein the first layer and the barrier layer are configured to define a tubular structure,
the tubular structure having a proximal and a distal end; and
wherein the ~~second material has a permeability lower than polyethylene for phenolic~~
~~compounds to prevent obstructions from forming in the formulation.~~ barrier layer is configured
to provide a barrier to the diffusion of phenolic compounds.

56. (Currently amended) The catheter as recited in claim 55, wherein the first ~~material~~ layer is disposed outside the ~~second material~~. barrier layer.

57. (Currently amended) The catheter as recited in claim 55, wherein the first ~~material layer~~ is disposed inside the ~~second material~~ barrier layer.

58. (Cancelled)

59. (Previously presented) The catheter as recited in claim 55, wherein the phenolic compounds comprise at least one of phenol and m-cresol.

60. (Currently amended) The catheter as recited in claim 55, wherein the ~~second material~~ barrier layer comprises a material selected from the group consisting of halogenated polymers.

61. (Previously presented) The catheter as recited in claim 60, wherein the halogenated polymer is selected from the group essentially consisting of polytetrafluorethylene, polyvinylidene chloride and polyvinylidene fluoride.

62. (Currently amended) The catheter as recited in claim 55, wherein the ~~second material~~ barrier layer comprises a material selected from the group consisting essentially of polyamides, ethylene-vinyl alcohol, polyetheretherketone, nylon and polyester.

63. (Currently amended) The catheter as recited in claim 55, wherein the ~~second material is~~ barrier layer comprises capillary glass.

64. (Currently amended) The catheter as recited in claim 55, wherein the ~~second material~~ barrier layer is diamond coated.

65. (Currently amended) The catheter as recited in claim 55, wherein the first ~~material~~ layer comprises a material that is bio-compatible.

66. (Currently amended) The catheter as recited in claim 55, wherein an inner surface of the first ~~material~~ layer substantially covers an outer surface of the ~~second-material~~ barrier layer.

67. (Currently amended) The catheter as recited in claim 55, wherein an inner surface of the first ~~material~~ layer covers only a portion of an outer surface of the ~~second-material~~ barrier layer.

68. (Currently amended) The catheter as recited in claim 67, wherein the portion of the outer surface of the ~~second-material~~ barrier layer covered by the inner surface of the first ~~material~~ layer is located at the distal end.

69. (Currently amended) The catheter as recited in claim 55, further comprising an interior layer contacting an inner surface of the ~~second-material~~ barrier layer, the interior layer comprising a substance that regulates an interaction of substances with the interior layer.

70. (Previously presented) The catheter as recited in claim 69, wherein the substance is a hydrophilic substance.

71. (Previously presented) The catheter as recited in claim 69, wherein the substance is a hydrophobic substance.

72. (Previously presented) The catheter as recited in claim 55, wherein the proximal end is connected to an implantable infusion pump.

73. (Currently amended) The catheter as recited in claim 55, wherein the first layer comprises a first material and the barrier layer comprises a second material and wherein the first material is more flexible than the second material.

74. (Currently amended) The catheter as recited in claim 55, wherein the first layer comprises a first material and the barrier layer comprises a second material and wherein the first material has a lower flexural modulus than the second material.

75. (New) The catheter as recited in claim 1, wherein the tubular structure is configured to inhibit expansion due to pressure within the tubular structure.

76. (New) The catheter as recited in claim 1, wherein the barrier layer is composed of a material having sufficient rigidity and density to inhibit expansion of the tubular structure due to pressure within the tubular structure.

77. (New) The catheter as recited in claim 55, wherein the tubular structure is configured to inhibit expansion due to pressure within the tubular structure.

78. (New) The catheter as recited in claim 55, wherein the barrier layer is composed of a material having sufficient rigidity and density to inhibit expansion of the tubular structure due to pressure within the tubular structure.